

various tables that have been introduced to facilitate the process and hasten the result. After one or two further applications of spherical trigonometry, we are brought face to face with that curious survival, known as a Lunar Distance, and we are quite sure that the author did some violence to his sense of practical utility when he devoted so many wearisome pages to the consideration of this obsolete problem. In the examination room of the Board of Trade, the thorny difficulties of "clearing the distance" may exercise a wholesome effect on the extra master, whose fate it is to attack this problem, and induce him to acquire a greater knowledge of nautical astronomy than he would otherwise do; but we imagine in the great majority of cases the applicant endeavours to forget all about the intricacies of the problem as soon as he is possessed of his qualifying "ticket." The skill of the mechanic has done much to remove the necessity of the ingenious device, but the rapid transit of vessels from port to port, and the numerous time signals in known longitudes, give to the mariner Greenwich Time more accurately than it was ever determined by the method of lunar distances. But for some reason known only to the authorities, an acquaintance with the method is demanded, though the necessary facility in manipulating the sextant cannot so well be required. The whole process affords an interesting case of the resources of analysis outrunning in accuracy the observations to which it is applied.

"Problems," says Earl Dunraven, "will be given you in the examination room on the infernal subject of magnetism and deviation," so he has much to say about the coefficients A to E. To many, we are afraid these coefficients will remain a matter of intricate manipulation, carrying no definite meaning; but if they follow the author's guidance, they ought to issue triumphantly from the examination ordeal. His rules are admirably arranged, and, from a purely mechanical point of view, leave nothing to be desired. We could have wished that the theory had been a little fuller, but we remember, a little regretfully, that the author's object is not to teach magnetism, but to pass the reader or student through an examination of a strictly limited character. We cannot but think that the book is eminently calculated to effect this object. Admirably printed, well and lavishly illustrated, furnished with numerous examples and written in a free and easy, but lucid style, we should imagine that this work is destined to become the most popular book on the subject, and that it will be the one guide and text-book to which the young officer will apply, to help him to meet and defy the terrors of Her Majesty's examiners. W. E. P.

#### THE CULTIVATION AND PRODUCTION OF COFFEE.

*Le Café, Culture—manipulation—production.* Par Henri Lecomte, Agrégé de l'Université, Docteur es Sciences, &c. Pp. vi + 342. (Paris: Georges Carré et C. Naud, 1899.)

COFFEE in its various commercial aspects, whether from the point of view of the planter, the broker, the retail dealer, or the consumer, has from time to time commanded a great deal of attention. Occupying as it does a large and extended area of cultivation within the

tropics, and being an important branch of industrial culture in many of the British possessions, as Jamaica, Ceylon, Southern India, and Borneo, it is but reasonable to expect that treatises on the cultivation, best means of improvement of yield and quality, prevention of disease, &c., would be numerous. In the English language many such works are available, and if this be so, bearing on a culture which though large and important is small in comparison with that of Brazil, Central America, Mexico, Java, and Sumatra, we might also expect to find a large number of books in the languages of the nations to which these extensive coffee growing countries belong.

The work before us is the latest contribution to the French literature of the subject, and extensive as that literature is and for the most part carefully worked out, M. Lecomte's handbook will be a useful and valuable addition not only for its arrangement, but also for the concise character of the information given and the various items of intelligence regarding production in the several countries referred to and exports therefrom.

The first chapter is devoted to the early history of the coffee plant. The botany of the genus *Coffea* is treated of in the second chapter occupying twenty-five pages, and is illustrated by a figure of the so-called Arabian coffee (*Coffea arabica*) in flower and in fruit, and a figure is also given of *C. stenophylla*, the tree which furnishes the wild coffee of Sierra Leone, as well as of the new species from the Congo, *C. canephora*, Pierre. In the enumeration of species given in this chapter thirty-three are referred to, prominence, of course, being given to *C. arabica* and *C. liberica*, the two most important coffee yielding species. The best varieties of *C. arabica* cultivated in various parts of the world are also enumerated. Referring to *Coffea stenophylla* the specific name of which, by the way, is spelt with a capital initial letter, the author gives the following interesting account of it: In 1894 some plants of this new species were received at the Royal Gardens, Kew, from Sierra Leone, and these plants produced flowers in 1895. Seeds were afterwards sent to most of the English colonies where it was thought the plant might flourish. In Ceylon, however, the results have not been satisfactory; but in Dominica, Jamaica, and Trinidad, the case has been different. In the Botanic Garden of Port of Spain, Trinidad, there are some fine fruiting examples of this tree quite free of disease. The author further regrets that this coffee has not yet been introduced into the French colonies. On the climate and elevation suitable for the success of coffee plantations the great coffee-growing country of Brazil has the first consideration. The remaining chapters are devoted to the consideration of soils, the choice of seeds, transplanting, manures, shade trees, &c. The use of simple diagrams showing the different positions in which the coffee plant and its shade trees may be placed will be found useful, as will also the list of trees suitable both for shade and shelter, amongst which we notice such well-known trees as *Albizia Lebbek*, *A. stipulata*, and *Exythrina indica*.

On the subject of harvesting or gathering the crop it is pointed out how extremely variable in the period of ripening its seeds the plant is in different countries. Thus in Cuba, Guadaloupe, and other islands of the Antilles, the harvest commences in August and is carried on through

November, while in Brazil it commences in May and ends in September.

Though the broad principles of the preparation of coffee for market are well known, the description here given, especially aided as it is by the practical illustrations, will be of especial value. No book on coffee could possibly be complete without a reference to the diseases to which the plant is subject, whether the disease belongs to the vegetable or animal kingdom. Consequently we find thirty-one pages devoted to this part of the subject. Substitutes for coffee also come under consideration, occupying, however, a comparatively small space, and though no doubt sufficient is said about them, their number might be considerably increased. Perhaps one of the most interesting parts of the book is that treating on production, in which each country is considered separately, the first chapter being devoted to the American Continent, and naturally leading off with Brazil. British, Dutch and French Guiana are also considered, and comparisons made with product and export, as are also those of Paraguay, Venezuela, Columbia, Costa Rica, Mexico and other places. The West Indies, including Jamaica, Porto Rico, Trinidad and other important coffee growing countries, as well as the Eastern countries and Africa, are also referred to. This part of the subject is practically illustrated by a map of the world, showing at a glance the geographical distribution of the coffee plant, together with the production of each country in kilogrammes, and the date to which the figures refer. A comparison of the produce of each country is readily gained by a series of disks of different sizes, with the names of the country beneath each, and the total in figures; from this it will be seen that Brazil is far ahead of any other individual country. An interesting table is also given showing the consumption of coffee in the principal countries of the world, from which it seems that of the European countries Germany consumes by far the largest quantity. The figures in tons for 1897 standing thus—Germany 136,390, France 77,310, England 12,420, while the consumption in the U.S. of America in the same year amounted to 318,170 tons. The book concludes with a table of subjects of the several chapters, but lacks that most necessary adjunct of all books—a good index.

#### THE BIRDS OF SURREY.

*The Birds of Surrey.* By J. A. Bucknill. Pp. lvi + 374, illustrated. (London: R. H. Porter, 1900.)

FROM its great extent of open moorland and the presence of several large sheets of water, Surrey occupies an unusually favourable position among the metropolitan counties for the development of a large bird-fauna; and since a very considerable portion of the county is now undergoing a metamorphosis under the hands of the builder as the area of the metropolis and its suburbs increase, it is most important that a full record should be secured of the species of birds which are fast disappearing from its limits. The compiling of such records, and the careful working out of the past history of locally distributed species within the limits treated of, seem, indeed, to be the chief justification for the publication of county ornithologies. And in this respect, as well as in the careful collection of local bird-

names, the author of the work before us appears to have discharged his task in a thoroughly satisfactory manner. An instance of this is afforded by his account of the occurrence of the black-grouse in Surrey. To many of our readers it will probably come as a surprise to learn that black-cock shooting was a recognised sport on the Surrey moors during the forties, and even to a considerably later date. At the present day there is, however, scarcely a single genuine wild bird of this species to be met with in the county; and the excellent history of its gradual extermination given by Mr. Bucknill should, therefore, be read with the greatest interest alike by sportsmen and by ornithologists. The raven, the buzzard, the marsh-harrier, and the dotterel are other species which have disappeared from the county, either totally or as nesting birds; the last record of the occurrence of the dotterel being 1845, when a couple of specimens were purchased from the landlord of an inn at Hindhead.

Of the numerous rare birds that have been noticed from time to time in the county, the great majority have been visitors to the well-known Frensham ponds, the larger of which extends into Hampshire. Here we are practically in Gilbert White's country; and in these favoured haunts have been seen the osprey, the spoonbill, several of the rarer kinds of duck, the goosander, and the purple heron. Sad to say, the arrival of these wanderers has for the most part been speedily followed by their slaughter; and, as the author remarks, hundreds of other avian rarities have doubtless been killed and eaten without record. Unhappily, the great increase in game preservation which has taken place of late years in the county appears to have been the cause of the diminution in the numbers of many of the rarer species of birds. But there are many country gentlemen, on the other hand, who are lovers of natural history, and who veto as much as possible the bird-slaying propensities of their gamekeepers. It is to such, and to the laws now in force for the protection of wild birds, that we have to look for the commencement of a better state of things in the wilder parts of the county. And the fact that the golden oriole and the hoopoe have been observed of late years on several occasions indicates the probability that these beautiful birds would once more nest in the Surrey groves if only they received adequate protection.

A feature of the book is the beautiful series of illustrations of Surrey scenery; the views of Frensham Great Pond and of the Surrey Weald being some of the best examples of landscape photogravure that have come under our notice. Although primarily intended for residents in the county (among whom we are glad to see that a long list of subscribers has been enrolled), the book is full of interest to all bird-lovers living in the south of England. R. L.

#### OUR BOOK SHELF.

*Untersuchungen ueber d. Vermehrung d. Laubmoose durch Brutorgane und Stecklinge.* Von Dr. Carl Correns, a.ö. Prof. d. Botanik in Tübingen. Pp. xxiv+472; mit 187 abbild. (Jena: Verlag v. Gustav Fischer, 1899.)

FEW people perhaps fully realise how abundantly the mosses are provided with modes of vegetative reproduction, even although they may be fully cognisant of the fact that the protonema—the precursor of the moss-